

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.:

Group Art Unit:

Inventors: Skare et al.

Filed: Concurrently

Title: Cryogenic Air Separation System
With Enhanced Liquid Capacity

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In accordance with 37 CFR 1.51, 1.56 and 1.97 to 1.99, the following is a relevance statement on each citation listed on attached form PTO-1449, and is made of record to assist the Patent & Trademark Office in its examination of this application:

U.S. 4,778,497 – Hanson et al. discloses a process to produce liquid cryogen wherein subcooled supercritical liquid is expanded without vaporization and a portion thereof is used to carry out the subcooling by vaporization under reduced pressure. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 4,894,076 – Dobracki et al. discloses a liquefaction process for atmospheric gases wherein one or more atmospheric gas streams are compressed to provide both an intermediate stream and a high pressure stream for use in the liquefaction process. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for

introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,231,835 – Beddome et al. discloses a liquefier process wherein dual turbine-booster compressor units are arranged for liquefaction operations using high pressure heat exchangers. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,678,425 – Agrawal et al. discloses a cryogenic system using a liquefier and a two stage distillation column wherein the system can produce liquid nitrogen and liquid oxygen in varying ratios. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,758,515 - Howard discloses a cryogenic air separation system wherein feed air is compressed in a multistage primary air compressor, a first part is turboexpanded and fed into a cryogenic air separation plant, and a second part is turboexpanded and at least a portion of the turboexpanded second part is recycled to the primary air compressor at an interstage position. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,799,505 – Bonaquist et al. discloses a system for producing cryogenic liquefied industrial gas wherein the output of the industrial gas production facility is pressurized, a portion passed to the use point, and another portion is condensed against a turboexpanded stream which is also taken from the pressurized gas. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,802,873 – Howard discloses a cryogenic rectification system wherein feed air is turboexpanded to generate refrigeration through two turboexpanders operating at the same inlet pressure but at different inlet temperatures. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.


U.S. 5,836,173 – Lynch et al. discloses a system for liquefying low boiling point gases wherein a feed gas and a recirculating refrigerant gas is compressed, a first portion turboexpanded, a second portion compressed to a supercritical pressure, and the supercritical fluid cooled against the turboexpanded fluid to produce cryogenic fluid. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 6,543,253 – Schaub et al. discloses a method for providing refrigeration to a cryogenic rectification plant wherein a working fluid is

pressurized in a recycle compressor, a first portion is at least partially condensed in a heat exchanger and passed into the plant, a second portion is cooled and then turboexpanded to generate refrigeration to condense the first portion, and the resulting second portion is returned to the recycle compressor. There is no disclosure of a cryogenic air separation system having enhanced liquid production capacity wherein a feed air stream bypasses the primary heat exchanger and is processed through cooling and warming passes of a feed air liquefier to produce liquid feed air for introduction into the cryogenic air separation plant, and thus this patent neither discloses nor suggests applicants' claimed invention.

A copy of each of the citations is enclosed herewith.

Respectfully submitted,


Stanley Ktorides
Attorney for Applicants
Reg. No. 29,399

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113
Phone: (203) 837-2178

Attorney Ref.: D-21351

Date: SEPTEMBER 17, 2003

Form PTO-1449 (Rev. 8-83)	U.S. Department of Commerce	Atty. Docket No. D-21351	Serial No.
Information Disclosure Citation (Use several sheets if necessary)		Applicants Skare et al.	
		Filing Date	Group

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	4 7 7 8 4 9 7	10/1988	Hanson et al.	62	11	
	4 8 9 4 0 7 6	1/1990	Dobracki et al.	62	9	
	5 2 3 1 8 3 5	8/1993	Beddome et al.	62	9	
	5 6 7 8 4 2 5	10/1997	Agrawal et al.	62	646	
	5 7 5 8 5 1 5	6/1998	Howard	62	646	
	5 7 9 9 5 0 5	9/1998	Bonaquist et al.	62	613	
	5 8 0 2 8 7 3	9/1998	Howard	62	646	
	5 8 3 6 1 7 3	11/1998	Lynch et al.	62	613	
	6 5 4 3 2 5 3	4/2003	Schaub et al.	62	643	5-24-02

FOREIGN PATENT DOCUMENTS

Document Number	Date	Country	Class	Subclass	Translation	
					Yes	No

Other Documents (including Author, Title, Date, Pertinent Pages, Etc.)

Examiner	Date Considered
----------	-----------------

* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.